REMARKS

The Office Action of July 25, 2006 has been received and its contents carefully considered.

The present Amendment cancels claim 19 and transfers its subject matter to claim 1. It also revises dependent claim 2 to conform to the change in claim 1. Section 6 of the Office Action rejects claim 19 under the first paragraph of 35 USC 112 on the ground that the limitations in claim 19 are not disclosed in the specification and this makes it difficult to understand the claimed invention. This rejection, which is now applicable to claim 1 in view of the claim revisions summarized above, is respectfully reversed for the reasons discussed below.

Figure 1 of the present application (and several other drawings) show what was recited in claim 19 and is now recited in claim 1. The drawings of an application are part of its disclosure. As MPEP section 608 states "Applicant may rely for disclosure upon the specification with original claims and drawings, as filed." Furthermore, the terminology that was used in claim 19 (and now appears in claim 1) is well-known in the art, as is the symbol for and SPDT switch. If any proof of this assertion is needed, it is provided by page "6 of 9" of an attachment, entitled "Basic Electricity," to this Amendment. Since the drawings show a mode selector 16 having a pair of single pole, double throw switches, and since this terminology for the type of switches shown in the drawings is well-known in the art, it is respectfully submitted that the rejection under the first paragraph of 35 USC 112 should be withdrawn. (The attachment was downloaded from the Internet on October 19, 2006 but represents what was common knowledge

within the art long before the document itself was downloaded, as the title "Basic Electricity" suggests.)

If the Examiner considers that it might be desirable, Applicant would not be advised to an Examiner's Amendment that changes paragraph [0026] to read as follows:

> **[0026]** The operation of the receiving circuit 10 is now briefly described. When the reproduction mode is selected, the digital signals 140 from the demodulator 14 are routed via the terminal *a* of the selector switch 160 and the terminal *c* of the selector switch 162 to the error detector 20 and to the data register 22. <u>As it is shown in the drawings, the selector switches 160 and 162 are single pole, double throw switches.</u> The ADPCM codec 24 effects decoding in keeping with the adaptive differential pulse code modulation on data 22a read out from the data register 22, while effecting error detection processing thereon.

The Office Action rejects claim 1 for obviousness based on Hachisuka et al (hereafter simply "Hachisuka") in view of Weiss, and it also relies on Hachisuka's switch 112 to reject claim 19. However, Hachisuka's switch 112 is only a single SPDT switch, while claim 19 (and now claim 1) recites "a pair of single pole, double throw switches that are connected to one another, both switches being responsive to a common selection signal." This is neither disclosed not suggested by Hachisuka, and the Weiss reference does not make up for this omission in Hachisuka. It is therefore respectfully submitted that the rejection of claim 1 for obviousness should be withdrawn.

The remaining claims depend (directly or indirectly) from claim 1, and recite additional limitations to further define the invention. They are therefore patentable along with claim 1 and need not be further discussed.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. Reconsideration of the application is therefore respectfully requested.

Respectfully submitted,

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AW/ng

Basic Electricity

IMPORTANT !!! DO NOT use wall current !!!
ALL of these circuits can be built using batteries (dry cells) only !!!
If you have *no* experience with wiring OR if you want suggestions on what supplies to buy, click here.

As is the case with the "Lincoln Cent Project", electricity is another good example of science being part of our everyday lives. Look around you. Your television, your clock radio, the computer you are using and many other electrical appliances are all utilizing electrical power.

To explain things as briefly as possible, electricity is a flow of electrons. Substances that allow electrons to flow freely are called conductors and those that don't are called insulators.

ELEMENTARY CIRCUITS

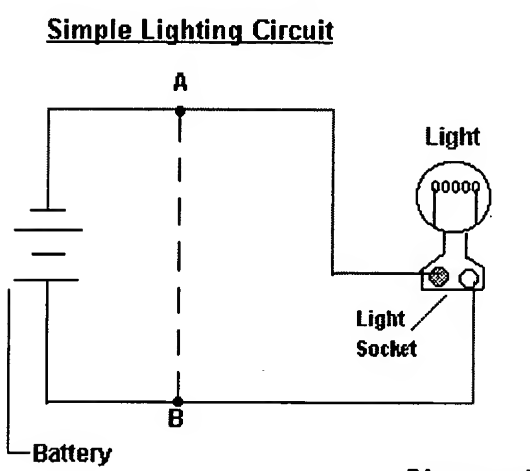


Diagram 1

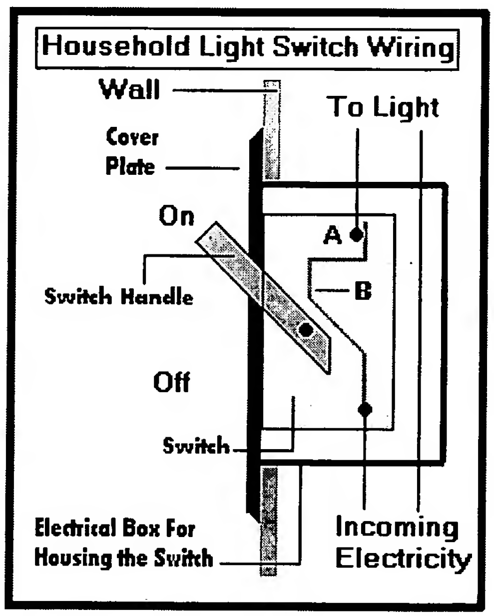
Diagram number 1 illustrates an extremely simple circuit. (For the moment, ignore the dotted line and the points A and B). The battery is represented by 4 lines (the longer line being positive and the shorter one negative). Starting from the negative end of the battery, electrons "circle" through one wire, pass through the light bulb, pass through the other wire and then return to the battery thereby completing the circuit. See? Quite simple.

This is all well and good but there are 2 drawbacks to this circuit 1) the light always stays on and 2) the power is constantly being used. How can we turn the light bulb 'off'? Well, we could unscrew the bulb from the socket but in the real world this is very inconvenient. (Light bulbs are inside fixtures, on ceilings and so

on). Perhaps we could disconnect the power at the source. This too is very inconvenient. You would have to go down to your basement to shut the power off. Or - *much more dangerous* - you would have to disconnect the electrical supply wire before it reaches the light socket.

Is there a safe way to interrupt the electron flow without physically touching the wire? Sure. It is called a SWITCH !!!

The *inside* of a typical household wall switch has a strip of metal (B), making contact with point 'A', completing the circuit and thereby conducting electricity to the light. This would obviously be the 'ON' position. When the insulated lever is moved down to the 'OFF' position, it pushes the metal strip away from point 'A', breaking the circuit and turning the light 'OFF'.
This type of switch (having a lever which "flips" it on and off) is called a toggle switch.



Because of being well-insulated and mounted in a box, household switches are a safe way for turning electrical devices on and off.

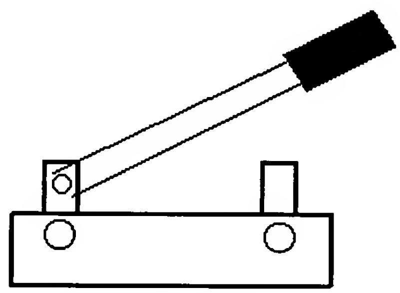
Finally, let's talk about that dotted line in Diagram 1. Now what would happen if point A and point B were to touch OR if they were connected with a wire or other conductor? Well, the light bulb would turn 'off', the wires and the battery would get very warm very fast and the electrons would simply travel from the battery to point A to point B and then back to the battery. Notice that in this new circuit , the electrons are travelling a path (or

circuit) that is *shorter* than the original one. Hence you have just learned what a "short circuit" is and how its name is derived! Short circuits are dangerous. They cause wires to heat, circuit breakers to 'trip' and can even start fires.

SWITCHES

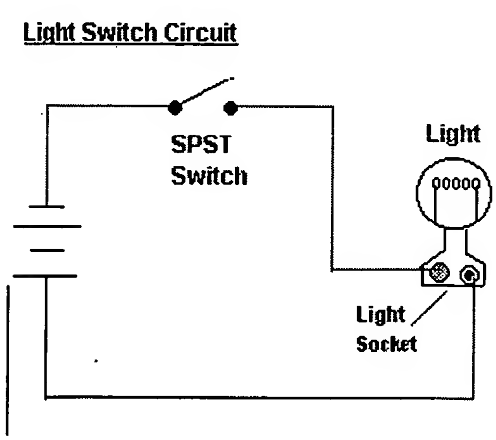
There are many different *types of switches:* toggle, rotary, pushbutton, "rocker", "pull-chain", slide, magnetic, mercury, timer, voice-activated, "touch-sensitive", and many others. Heck, even the Clapper™ is another type of switch !

The *"knife switch"* (rarely seen nowadays) is the type that most easily demonstrates the functioning of a switch. Old sci-fi movies ("Frankenstein (1931)" or "Young Frankenstein (1974)" , for example), made extensive use of these switches in the laboratory scenes.



Knife Switch

Today, use of knife switches has been confined to 1) heavy-duty industrial applications and 2) demonstration purposes - science projects for example. The knife switch has a metal lever, insulated at the 'free end' that comes into contact with a metal 'slot'. Since the electrical connections are exposed, knife switches are never seen in household wiring.



is very similar to Diagram 1 except a switch has been added. Compare this to the Typical Household Light Switch diagram. Pretty much the same principle at work wouldn't you say? This type of switch is a Single Pole Single Throw (or SPST). This means that it controls one wire (pole) and it

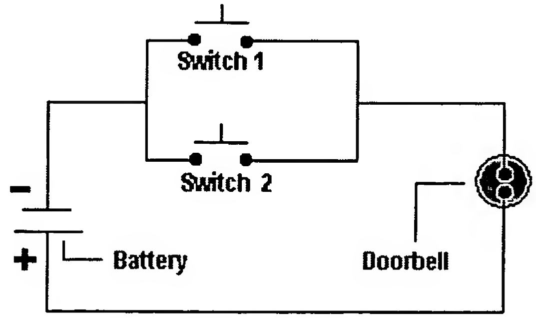
└Battery

Diagram 2

makes 1 connection (a throw). Yes, this is an on/off switch, but a 'throw' only counts when a connection is made. 'Off' is not considered a 'throw'. Also notice that only 1 wire has to be switched. (Following the circuit from one end of the battery to the other you can see why this is so).

As it is, this circuit alone could be your science project. A variation could be substituting a push-button switch and putting a 'buzzer' or 'doorbell' where the light is. Now you have a good demonstration of how a doorbell is wired. Pushbutton switches are *usually* "momentary on". That is to say the connection is made only when you press the button. There are "momentary off" pushbutton switches, but using one in a doorbell circuit would mean the bell would be constantly on *until* someone pressed the button. Impractical don't you think? (The comedian Tim Conway joked that his father wired a doorbell in just this way. When there was silence someone would say "Hey somebody's at the door").

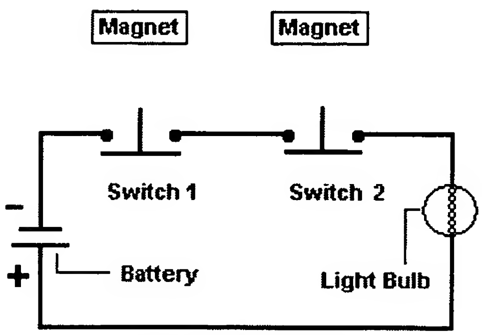
A practical use of the *momentary off* switch is the "mute button" on your telephone. If a momentary on switch were used, it would be very annoying to press the button constantly as you talked and released it only for muting. This shows how each type of switch has its specific applications.



Dual Button Doorbell Wiring

The above diagram shows an interesting variation of doorbell wiring. The 2 doorbell buttons do not have to be right next to each

other. One button could be at a front door and the other at a side door. If you follow the circuit, you can see that pressing *either* button will cause the doobell to ring. The 2 switches are said to be wired in *parallel.*

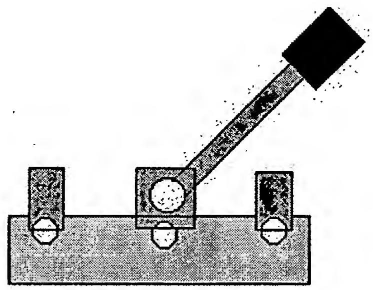


Burglar Alarm Circuit

The burglar alarm circuit at left employs magnetic switches. These switches and their associated magnets are generally mounted on doors and windows. Notice that Switch 1 and Switch 2 are wired in *series. Both* switches must be closed in order for the circuit to be complete and for the bulb to light. (This would indicate the 'armed' status of this burglar alarm.) Magnetic switches come in 2 varieties - "Normally Closed" and "Normally Open". These 2 terms describe the state of the switch when it is NOT being controlled by the magnet. The switches in this diagram are the "Normally Open" type and because the magnets are far enough away, the switches are in the 'open' state. If the magnets were brought closer, the bulb would go on and the circuit would be "armed". At this point, moving *either* magnet would make the bulb go out and the alarm would be triggered. (For the sake of simplicity, the activated alarm circuit has not been drawn). An important point to note is that cutting the wires at *any* point would also make the bulb go out and trip the alarm.

The next type of switch (no diagram) is the Double Pole Single Throw (DPST). These switches are used when there are 2 'live' lines to switch but can only turn on or off (single throw). These switches are not used much and are usually found in 240 volt applications.

Single Pole Double Throw Switches



SPDT Knife Switch

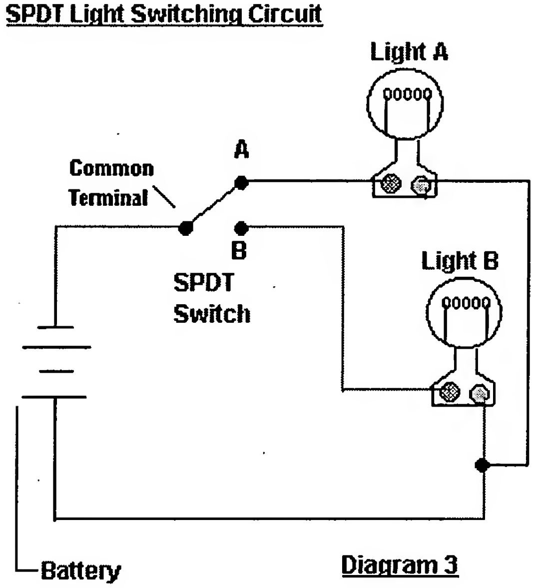


Diagram 3 makes use of the Single Pole Double Throw Switch. The common terminal is the middle terminal in the SPDT Knife Switch or if you are using a household switch, it would be the brass colored terminal. (the other 2 would be silver colored). This circuit clearly demonstrates what happens when the SPDT switch is moved back and forth. Light A goes on and B goes off, B goes on and A goes off and so forth. You can see that this popular switch would have *many* practical applications: the transmit/receive button on a "2-way" radio, the "high/low beam" switch for your car headlights, the pulse/tone dialing switch on your telephone, and so on.

If you are using the SPDT knife switch, you have a "center off" position, which an ordinary wall switch would NOT have in which case you will need to add an SPST switch for shutting this circuit off. (In electronics work, many SPDT switches have a middle position in which the electricity is turned off to BOTH circuits. It is an SPDT center off switch. Also, some electronic

SPDT switches have a "center on" position. The best example of this type of switch is the "pickup" selector on an electric guitar which can choose the rhythm, treble or both pickups for 3 varieties of sounds).

Diagram 4 (below) depicts what is probably the most common use for the SPDT switch - the 3 way light switching circuit. Electricians incorrectly call the SPDT switch a "3 way switch". The proper terminology should be "three terminal switch". However the term 3-way switch has stuck and it's a misnomer we'll just have to live with.

"3-Way Switch" Wiring Diagram

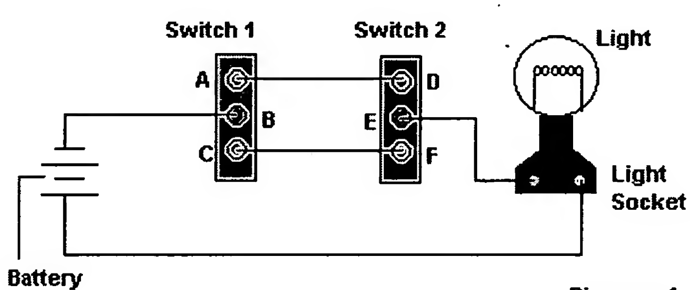


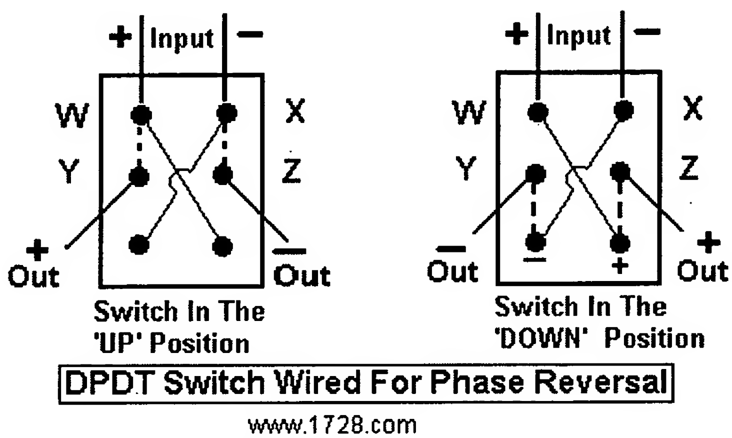
Diagram 4

So, how does this work? Let's say that Switch 1 is at the bottom of a stairway and Switch 2 is at the top. Suppose Switch 1 is in a 'down' position (B & C connected) and Switch 2 is in an 'up' position (D & E connected). The light bulb is off. Now someone comes to the bottom of the stairs and flips Switch 1 'up'. If you follow the circuit you can see why the light bulb would now turn on because A & B and D & E are connected. When the person reaches the top of the stairs, Switch 2 is flipped 'down', E & F are now connected and so the light bulb goes off. Another person shows up at the bottom of the stairs and flips Switch 1 'down', connecting B & C thereby turning the light on again. The person reaches the top of the stairs, flips Switch 2 'up' connecting D & E and the light bulb goes off. Notice that in the case of the second person, a downstroke turns the bulb on and an upstroke turns the bulb off. If you have such switches in your house OR if you have purchased household wall switches for this circuit, you now see the reason why they do NOT have the words on and off printed on them.

Don't you think this switching arrangement would make a great science project?

The Double Pole Double Throw Switch

A simple way to think of this switch is imagining 2 SPDT switches side by side with the 'handles' attached to each other. Perhaps the most popular use for this switch is 'phase or polarity reversal'. So, how does the DPDT switch accomplish this? First, *you* have to wire the 2 'top' and 2 'bottom' terminals in a 'criss-cross' fashion. The top 2 terminals become the input and the middle two terminals become the ouput. Now, referring to the bottom left diagram, the switch is in the 'up' position, W & Y are connected, as are X & Z. The polarity is maintained because the input and output are directly connected. No problem seeing that right?



DPDT Switch Wired For Phase Reversal

Now let's see what happens when the switch is in the 'down' position (right diagram). The + input goes from the 'W' terminal, down to the lower right and then up to the 'Z' terminal. The negative input goes from the 'X' terminal and out through the 'Y' terminal. See what has happened? With one flip of a switch, polarity has been reversed. What applications does this have? For one thing, electric guitar players use this type of switch to put one pickup out of phase with the other, producing a thin, 'squawcky', 'inside-out' kind of sound. In the 'old days' before 3 prong plugs, power switches on some electrical devices used this switching arrangement to switch polarity in case the plug was in the outlet the "wrong way".

Another important (though not very common) use is to put this switch between 3-way switches so that the same light may be

switched from *many* different locations. Referring to Diagram 4, if A & B and E & F were connected, the bulb would be off. But now think of the wires going from A to D and C to F. If their connections were reversed, (A to F, C to D), the light bulb would turn on again. So, how would we be able to reverse the polarity of these 2 wires? By using the polarity reversing switch ! (See Diagram 5 below).

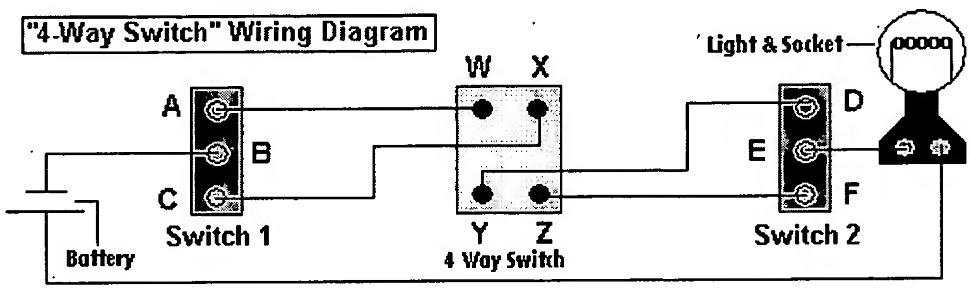


Diagram 5

Incidentally, electricians have once again stuck us with another misnomer by calling this a "4-way" switch. Can you see what the 4-way switch is? It is a DPDT switch, wired for phase reversal without the bottom 2 terminals exposed (they don't have to be). If you can buy a 4-way switch, great. If not, you know how to make one right? Also, you don't have to limit yourself to using just one 4-way switch. If you were to attach another 4-way switch from the 'Y' 'Z' terminals to the 'W' 'X' terminals of the next switch, you could have the same light switched from a 4th location. Or you could add a 5th or 6th, etc. Now wouldn't that make an impressive science project?

Good luck with the project !!!

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